

Opportunities to improve winemaking profitability



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A team of process experts at The Australian Wine Research Institute is offering a paradigm shift for grape and wine producers competing in a crowded global market. The approach is highly practical and focussed on efficiency, drawing on the team's collective years of experience in technical winemaking and advanced manufacturing methods.

This article is based on a presentation delivered to generate discussion at the Crush 2011 wine science symposium held in Adelaide on 28-30 September at the National Wine Centre and the Waite Campus of The University of Adelaide.

If the Australian wine industry was a restaurant, it would be employing some of the world's leading chefs. Their creations would be worthy of Michelin stars, and recognised globally.

The problem is that our 'restaurant' has competition, located directly alongside our shopfront. The competition also employs outstanding 'chefs', but with much lower labour costs. The result is that our restaurant is losing money. So, our industry is not flourishing, despite our reputation for excellence, capacity for innovation and ability to deliver quality.

The wine industry is not alone. A number of sectors – from hospitality to manufacturing – have experienced and survived similar competitive pressures. The car industry, for example, continues to see global realignment as both New and Old World economies jockey for position.

The wine industry must learn from the thinking that has transformed successful manufacturing companies' practices over the past two decades. That thinking comes down to one key concept that is well-known to marketing strategists, as well as process experts.

The concept is this: maximise a product's worth to the consumer and seek, development and apply the most cost-effective ways to meet this market demand. This poses several questions:

- What does the market want?
- How can we create a process – or value chain – that delivers?
- How can we deliver, and make money?

Traditionally, many Australian wine producers have tended to make outstanding wine and, then, rely on promotional efforts to target and build

market share. This approach is effective when competition is scarce, and the market values outstanding quality. Unfortunately, to many wine consumers, the product's value proposition is not immediately apparent, in contrast to buying clothes or a car.

Many wine consumers know little about wine. A number of research studies – conducted by the AWRI and other research bodies – show that in blind tastings, consumer preference is driven by experience and engagement, and that most consumers lack sufficient appreciation for outstanding quality.

The less informed consumer, making up the majority, is more likely to be driven by a general preference for sweet, fruity wines.

The more consumers know about wine, the more likely they are to recognise and dislike wine faults and appreciate quality attributes, such as flavour intensity, complexity and mouthfeel.

AN APPROACH TO WINERY COST-REDUCTION STRATEGIES

We will outline the paradigm of what consumers value, to highlight opportunities to improve profitability through cutting production cost; 'consumer value' being product attributes that a customer is prepared to pay for. This same thinking can be used in efforts to improve profitability through 'premiumisation' or generate niche markets; for example, using process expertise to create identified product attributes and increase profitability through increased sale prices.

Except for the very small market segments that buy iconic and ultra-premium wines, price is always a purchasing criterion. Consequently, successful businesses will seek to maximise customer value and minimise production cost.

Consumer research results have the potential to be confronting. A wine that is appealing to the trained and experienced palates of Australia's dedicated winemakers would not necessarily be the preference of the majority of consumers that like sweet, fruity wines. Depending on why you are in business, the challenge for winemakers is to design wine styles that may not be to their preference, or only invest resources in the production of attributes that meet the preferred profile of the target market. Are there opportunities to reduce winemaking costs by limiting resource use to create wines with attributes that many consumers prefer?

The AWRI's process experts have been trained to identify how to align production operations with the creation of product worth at minimal cost. Indeed, as process experts who have worked in the mining and car industries, its team is focussed on knowing where dollars can be spent, and saved, at every stage of the production process.

The approach is simple, setting out to deliver maximum customer value, with minimal waste, where value is defined as an attribute for which a customer will pay. Experience has taught us that of all the tasks performed in manufacturing industries, typically only 5% add to the value of the raw materials they process. However, the most successful, advanced manufacturing companies operate at percentages significantly higher than this.

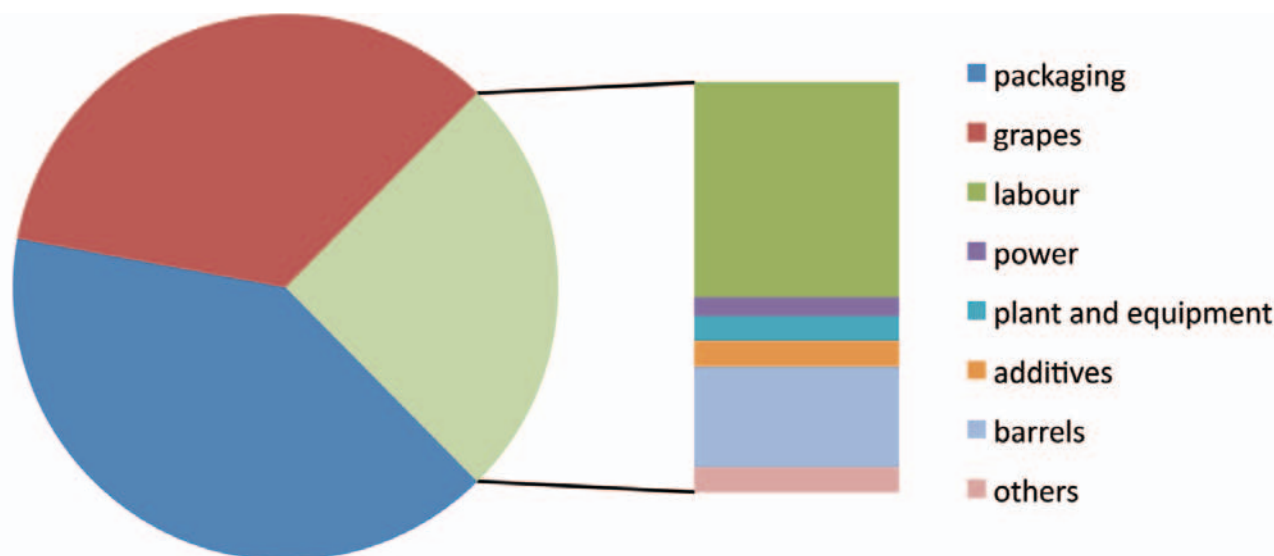


Figure 1. Example of relative winery operations input costs for a medium-sized winery, used to highlight that a 10% improvement in some inputs will generate much larger bottom-line savings.

In some wine companies, less than 5% of all activity is value-adding. Benchmarking work conducted in some wineries has shown us that there is significant opportunity to cut costs and increase profitability.

Improving profitability requires more than mere efficiency. Our thinking goes beyond bargaining

for better deals on grapes, glass or labelling.

Our approach, as process experts, requires interrogation of the steps taken to produce wine. Across every step, we ask: 'Why, and how?' Why is this step necessary, and how does it relate directly to market need?

Our findings, to date, have revealed

some obvious targets. Consumers do not want to pay a premium incurred due to costs attached to waiting or under-productivity by production people or equipment; equipment sitting idle is an unused resource, and people paid to wait, or unable to use their skills or expertise to generate value, undermine cost-efficiency. ►

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Similarly, queues of material can be minimised, along with scrap or the need to correct errors. Transportation is also an area of opportunity, with the potential to reduce transport distance, cost and time. Finally, we are also able to identify cases of over-processing and over-production – where effort and resources are invested in creating wines that the market does not necessarily want or need in that brand's market segment and price point.

As Figure 1 illustrates (see page 19), grape production and packaging account for the largest areas of expense in wine production. Just a 5-10% saving in one or both of these areas stands to make a significant financial impact on overall profitability, compared with efficiency measures in other areas. While there are significant opportunities to save cost through reducing power, development work conducted by our process experts demonstrates that focussing on grapes and value-chain analysis may produce bigger savings.

EXTRACTING MORE VALUE FROM GRAPES

If the aim is to identify how we can maximise value creation in the consumer's

eyes from grapes through the production process as a whole, grape production is a key area to consider.

Three potential strategies could be used to improve profitability in grape production from a process optimisation perspective. First, is the maximum use of low-cost grapes as 'fillers' in wine styles that are specifically tailored to meet consumer taste preference profiles. New processing technologies, such as Ferment Aroma Capture, have the potential to assist in extracting maximum benefit from low-cost fruit by enhancing flavour and aroma through back additions.

This complements a focus on higher yields in the vineyard itself – our second recommendation when targetting reduced cost in grape production, and this may require a different approach to irrigation, pruning regimes and trellis design. While some market segments, varieties and wine styles require low vineyard yields, this principle does not necessarily apply to all market segments.

Finally, the cost-saving strategy advocates wine styles that allow minimal separation of press fractions and less conservatism in the cuts required.

The outcome is grape juice at a lower cost – an important saving when producing

wines that meet customer demand in some market segments. Any risk of product quality lost through applying these initiatives could be off-set by implementing new process technology.

As mentioned, one such technology is called Ferment Aroma Capture. During fermentation, 10,000 litres of grape juice emit some 500,000L of carbon dioxide, accompanied by other compounds that play a key role in determining wine flavour and aroma. The AWRI process experts have demonstrated technology to 'add back' those compounds lost through the fermentation process, enhancing the sensory and aromatic qualities of wines.

Scientists at the AWRI have also demonstrated that winemakers are not capitalising on the full potential of flavour and aroma precursors in grapes. Very little of the available flavour and aroma precursor compounds in grapes are actually released to add value to the wine. Research is demonstrating improvement opportunities, such as increasing the length of time between mechanical harvesting and pressing, to increase the generation of tropical thiols during fermentation, or the use of yeasts proven to release more flavour-active compounds.



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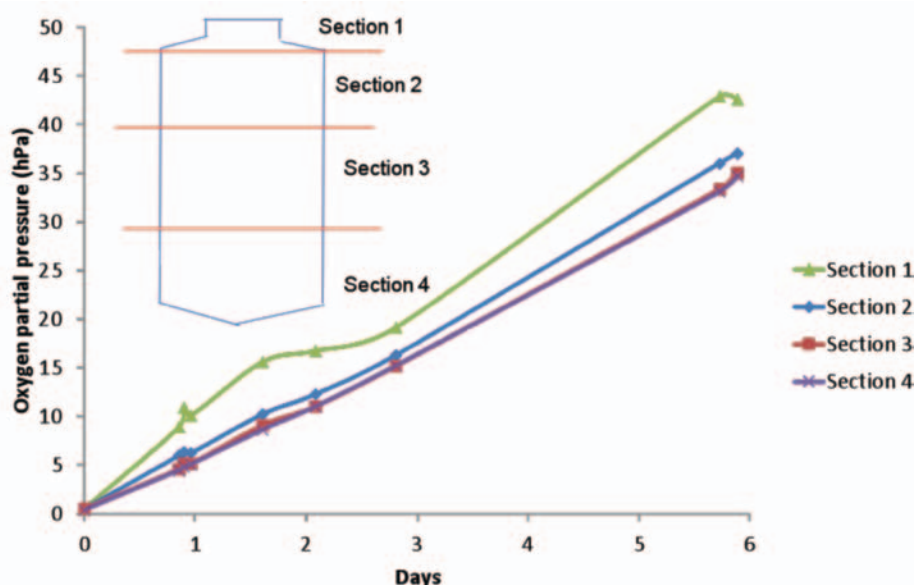


Figure 2. Oxygen diffusion rate into a sealed tank evacuated with carbon dioxide at time $t=0$ days.

VALUE STREAM ANALYSIS

In order to work out where efficiency savings can be made, process experts use 'value-stream analysis' to evaluate where opportunities lie to eliminate waste in a production process. Any activities that do not transform raw materials or information are not adding value. The higher the ratio of value adding to non-value adding activities, the better business efficiency will be.

The value-stream analysis should include value-stream mapping, process mapping and strategic analysis activities to align resource use with value as perceived by the customer.

Value-stream mapping draws a visual presentation of every process in the material, and information flows from the customer to the raw material supplies. This provides a platform for assessment of whether the workflows are optimal. Process mapping is a more detailed assessment of the tasks involved in each process and whether there are opportunities to eliminate waste.

A value-stream analysis conducted on a medium-sized winery highlighted wine transfer operations as a significant source of waste. Finished wines were often transferred eight times, simply to avoid tanks being left 'on ullage'. Wine transfer costs, such as staff time, wine losses, cleaning chemicals and wastewater generation, are all waste as they add no value to the consumer. Research is under way by AWRI Commercial Services to develop improved technology, so that wine can be safely stored in ullaged tanks. Part of this work investigated the effectiveness of powdered CO_2 in removing and keeping oxygen out of the ullage space.

The research demonstrated that not only does CO_2 dissolve in the wine, creating a vacuum resulting in airflow into the ullage space – it also showed it is a misconception that CO_2 creates a fully effective barrier over the wine (see Figure 2). In the meantime, wineries seeking to reduce transfers between tanks can do so by producing fewer quality categories and product types, and by blending earlier in the value chain.

In the wine industry – as in any industry – it is essential to understand what customers value; value being a product's attributes for which customers are prepared to pay. This enables wineries empowered with this information to build additional value into their products targeting increased market share or sales prices, and to reduce cost through eliminating resource use that does not create value. This article has focussed on opportunities to improve profitability through identification and reduction of waste in production, and through the use of lower cost resources which still deliver a wine with high consumer appeal. It is important to state that this is not the whole story, as consumers buy into more than just the contents of a bottle. Other product attributes, such as its brand image and perception, are also a critical factor to consider. While this subject is not covered in this article, the same principles can be applied – ensuring the whole package presented to the market place is aligned with what consumers value.

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